

[Sequence Listing]

<110> Takeda Chemical Industries, Ltd.

<120> Novel G protein-coupled receptor protein, its DNA and ligand thereof

<130> 2568USOP-CIP

<150> US 09/831,758

<151> 2001-05-11

<150> PCT/JP99/06283

<151> 1999-11-11

<150> JP 10-323759

<151> 1998-11-13

<150> JP 11-060030

<151> 1999-03-08

<150> JP 11-106812

<151> 1999-04-14

<150> JP 11-166672

<151> 1999-06-14

<150> JP 11-221640

<151> 1999-08-04

<150> JP 11-259818

<151> 1999-09-14

<160> 62

<210> 1

<211> 180

<212> PRT

<213> Human

<400> 1

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Ser Asn Leu His Ser Lys Glu Asn Tyr Asp Lys Tyr Ser Glu Pro Arg
 35      40      45
Gly Tyr Pro Lys Gly Glu Arg Ser Leu Asn Phe Glu Leu Lys Asp
 50      55      60
Trp Gly Pro Lys Asn Val Ile Lys Met Ser Thr Pro Ala Val Asn Lys
 65      70      75      80
Met Pro His Ser Phe Ala Asn Leu Pro Leu Arg Phe Gly Arg Asn Val
 85      90      95
Gln Glu Glu Arg Ser Ala Gly Ala Thr Ala Asn Leu Pro Leu Arg Ser
100      105      110
Gly Arg Asn Met Glu Val Ser Leu Val Arg Arg Val Pro Asn Leu Pro
115      120      125
Gln Arg Phe Gly Arg Thr Thr Thr Ala Lys Ser Val Cys Arg Met Leu
130      135      140
Ser Asp Leu Cys Gln Gly Ser Met His Ser Pro Cys Ala Asn Asp Leu
145      150      155      160
Phe Tyr Ser Met Thr Cys Gln His Gln Glu Ile Gln Asn Pro Asp Gln
165      170      175
Lys Gln Ser Arg
180

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<210> 2

<211> 540

<212> DNA

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<400> 2

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gaattaaaag attggggacc aaaaaatggt attaagatga gtacacctgc agtcaataaa 240
atgccacact ccttcgcca cttgccattg agatttggga ggaacgttca agaagaaaga 300
agtgcctggag caacagccaa cctgcctctg agatctgga agaatatgga ggtgagcctc 360

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gtgagacgtg ttctaacct gcccacaaagg ttgggagaa caacaacagc caaaagtgtc 420
 tgcaggatgc tgagtattt gtgtcaagga tccatgcatt caccatgtgc caatgactta 480
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<220>
 <223> primer

<400> 3
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<210> 4
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<220>
 <223> primer

<400> 4
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<210> 5
 <211> 30
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<220>
 <223> primer

<400> 5
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<210> 6
 <211> 27
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<220>
 <223> primer

<400> 6
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<210> 7
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<220>
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<400> 7
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<210> 8
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 <212> PRT
 <213> Human

<400> 8
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 20 25 30
 Ser Asn Leu His Ser Lys Glu Asn Tyr Asp Lys Tyr Ser Glu Pro Arg
 35 40 45
 Gly Tyr Pro Lys Gly Glu Arg Ser Leu Asn Phe Glu Glu Leu Lys Asp
 50 55 60
 Trp Gly Pro Lys Asn Val Ile Lys Met Ser Thr Pro Ala Val Asn Lys
 65 70 75 80
 Met Pro His Ser Phe Ala Asn Leu Pro Leu Arg Phe Gly Arg Asn Val
 85 90 95

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Glu | Glu | Arg | Ser | Ala | Gly | Ala | Thr | Ala | Asn | Leu | Pro | Leu | Arg | Ser |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| Gly | Arg | Asn | Met | Glu | Val | Ser | Leu | Val | Arg | Arg | Val | Pro | Asn | Leu | Pro |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| Gln | Arg | Phe | Gly | Arg | Thr | Thr | Thr | Ala | Lys | Ser | Val | Cys | Arg | Met | Leu |
| | 130 | | | | 135 | | | | | | 140 | | | | |
| Ser | Asp | Leu | Cys | Gln | Gly | Ser | Met | His | Ser | Pro | Cys | Ala | Asn | Asp | Leu |
| 145 | | | | 150 | | | | | 155 | | | | | 160 | |
| Phe | Tyr | Ser | Met | Thr | Cys | Gln | His | Gln | Glu | Ile | Gln | Asn | Pro | Asp | Gln |
| | | | 165 | | | | | 170 | | | | | 175 | | |
| Lys | Gln | Ser | Arg | Arg | Leu | Leu | Phe | Lys | Lys | Ile | Asp | Asp | Ala | Glu | Leu |
| | | | 180 | | | | | 185 | | | | | 190 | | |
| Lys | Gln | Glu | Lys | | | | | | | | | | | | |
| | | 195 | | | | | | | | | | | | | |

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| acatcaaaca tttttgtgc agatgaatta gtgatgtcca atcttcacag caaagaaaat | 120 |
| tatgacaaat attctgagcc tagaggatac ccaaaagggg aaagaagcct caattttgag | 180 |
| gaattaaaag attggggacc aaaaaatggtt attaagatga gtacacctgc agtcaataaa | 240 |
| atgccacact ccttcgccaa ctggccattg agatttggga ggaacgttca agaagaaaga | 300 |
| agtgtctggag caacagccaa cctgcctctg agatctggaa gaaatatgga ggtgagcctc | 360 |
| gtgagacgtg ttctaacct gcccacaaagg tttgggagaa caacaacagc caaaagtgtc | 420 |
| tgcaggatgc tgagtattt gtgtcaagga tccatgcatt caccatgtgc caatgactta | 480 |
| ttttactcca tgacctgcca gcaccaagaa atccagaatc ccatcaaaa acagtcaagg | 540 |
| agactgctat tcaagaaaat agatgatgca gaattgaaac aagaaaaa | 588 |

<210> 10
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

| | |
|-------------------------------|----|
| <400> 10 | |
| gcctagagga gatctaggct gggagga | 27 |

<210> 11
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

| | |
|-------------------------------|----|
| <400> 11 | |
| gggaggaaca tggaagaaga aaggagc | 27 |

<210> 12
 <211> 27
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

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| <400> 12 | |
| gatggtgaat gcatggactg ctggagc | 27 |

<210> 13
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 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

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<210> 14

<211> 196
<212> PRT
<213> Bovine

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Ser Ser Leu Leu Thr Ser Asn Ile Phe Cys Thr Asp Glu Ser Arg Met
20 25 30
Pro Asn Leu Tyr Ser Lys Lys Asn Tyr Asp Lys Tyr Ser Glu Pro Arg
35 40 45
Gly Asp Leu Gly Trp Glu Lys Glu Arg Ser Leu Thr Phe Glu Glu Val
50 55 60
Lys Asp Trp Ala Pro Lys Ile Lys Met Asn Lys Pro Val Val Asn Lys
65 70 75 80
Met Pro Pro Ser Ala Ala Asn Leu Pro Leu Arg Phe Gly Arg Asn Met
85 90 95
Glu Glu Glu Arg Ser Thr Arg Ala Met Ala His Leu Pro Leu Arg Leu
100 105 110
Gly Lys Asn Arg Glu Asp Ser Leu Ser Arg Trp Val Pro Asn Leu Pro
115 120 125
Gln Arg Phe Gly Arg Thr Thr Thr Ala Lys Ser Ile Thr Lys Thr Leu
130 135 140
Ser Asn Leu Leu Gln Gln Ser Met His Ser Pro Ser Thr Asn Gly Leu
145 150 155 160
Leu Tyr Ser Met Ala Cys Gln Pro Gln Glu Ile Gln Asn Pro Gly Gln
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Lys Asn Leu Arg Arg Arg Gly Phe Gln Lys Ile Asp Asp Ala Glu Leu
180 185 190
Lys Gln Glu Lys
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<213> Bovine

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tatgacaaat attccgagcc tagaggagat ctaggctggg agaaagaaag aagtcttact 180
tttgaagaag taaaagattg ggcttccaaaa attaatga ataaacctgt agtcaacaaa 240
atgccacatt ctgcagccaa cctgccactg agatttggga ggaacatgga agaagaaagg 300
agcactaggg cgatggccca ccctgcctctg agactcggaa aaaatagaga ggacagcctc 360
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<213> Artificial Sequence

<220>
<223> primer

<400> 16
ccctggggct tcttctgtct tctatgt 27

<210> 17
<211> 26
<212> DNA
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<220>
<223> primer

<400> 17
agcgattcat tttattgact tttagca 26

<210> 18
<211> 203
<212> PRT
<213> Rat

<400> 18

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 Ser Ser Phe Leu Thr Ser Asn Thr Leu Cys Ser Asp Glu Leu Met Met
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 Pro His Phe His Ser Lys Glu Gly Tyr Gly Lys Tyr Tyr Gln Leu Arg
 35 40 45
 Gly Ile Pro Lys Gly Val Lys Glu Arg Ser Val Thr Phe Gln Glu Leu
 50 55 60
 Lys Asp Trp Gly Ala Lys Lys Asp Ile Lys Met Ser Pro Ala Pro Ala
 65 70 75 80
 Asn Lys Val Pro His Ser Ala Ala Asn Leu Pro Leu Arg Phe Gly Arg
 85 90 95
 Asn Ile Glu Asp Arg Arg Ser Pro Arg Ala Arg Ala Asn Met Glu Ala
 100 105 110
 Gly Thr Met Ser His Phe Pro Ser Leu Pro Gln Arg Phe Gly Arg Thr
 115 120 125
 Thr Ala Arg Arg Ile Thr Lys Thr Leu Ala Gly Leu Pro Gln Lys Ser
 130 135 140
 Leu His Ser Leu Ala Ser Ser Glu Ser Leu Tyr Ala Met Thr Arg Gln
 145 150 155 160
 His Gln Glu Ile Gln Ser Pro Gly Gln Glu Pro Arg Lys Arg Val
 165 170 175
 Phe Thr Glu Thr Asp Asp Ala Glu Arg Lys Gln Glu Lys Ile Gly Asn
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 Leu Gln Pro Val Leu Gln Gly Ala Met Lys Leu
 195 200

<210> 19
 <211> 609
 <212> DNA
 <213> Rat

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 tatggaaaat attaccagct gagaggaatc ccaaaagggg taaaggaaag aagtgtcact 180
 ttccaagaac tcaaagattg gggggcaaaag aaagatatta agatgagtc agcccttgcc 240
 aacaaagtgc ccactcagc agccaacctt ccctgaggt ttggaggaa catagaagac 300
 agaagaagcc ccagggcagc ggccaacatg gaggcaggga ccatgagcca ttttccagc 360
 ctgccccaaa ggtttgggag aacaacagcc agacgcata ccaagacact gectggtttg 420
 ccccgaaaat ccctgcactc cctggcctcc agtgaatcgc tctatgccat gacccgccag 480
 catcaagaaa ttcagagtc tggtaagag caacctagga aacgggtgtt cacggaaaca 540
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 atgaagctg 609

<210> 20
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 <213> Artificial Sequence

<220>
 <223> base sequence encoding RFGR sequence

<220>
 <221> variation
 <222> 3
 <223> n means any of a, g, t or c.

<220>
 <221> variation
 <222> 9
 <223> n means any of a, g, t or c.

<400> 20
 mgnttyggna ar

12

<210> 21
 <211> 12
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> base sequence encoding RSGK sequence

<220>
 <221> variation
 <222> 3

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 9

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 12

<223> n means any of a, g, t or c.

<400> 21

mgnttyggnm gn

12

<210> 22

<211> 12

<212> DNA

<213> Artificial Sequence

<220>

<223> base sequence encoding RSGR sequence

<220>

<221> variation

<222> 3

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 6

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 9

<223> n means any of a, g, t or c.

<400> 22

mgnwsnggna ar

12

<210> 23

<211> 12

<212> DNA

<213> Artificial Sequence

<220>

<223> base sequence encoding RLGK sequence

<220>

<221> variation

<222> 3

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 6

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 9

<223> n means any of a, g, t or c.

<220>

<221> variation

<222> 12

<223> n means any of a, g, t or c.

<400> 23

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12

<210> 24

<211> 12

<212> DNA

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<220>
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<220>
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<223> n means any of a, g, t or c.

<400> 24
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<220>
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<222> 9
<223> n means any of a, g, t or c.

<220>
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<222> 12
<223> n means any of a, g, t or c.

<400> 25
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12

<210> 26
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<220>
<223> primer

<400> 26
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<210> 27
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 27
ttctcccaaa cctttggggc aggtt

25

<210> 28
<211> 28
<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 28

acagcaaaga aggtgacgga aaatactc

28

<210> 29

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 29

atagatgaga aaagaagccc cgcagcac

28

<210> 30

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 30

gtgctgcggg gcttcttttc tcatttat

28

<210> 31

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 31

ttagactta gacgaaatgg a

21

<210> 32

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 32

gctccgtagc ctcttgaagt c

21

<210> 33

<211> 188

<212> PRT

<213> Mouse

<400> 33

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20 25 30
Pro His Phe His Ser Lys Glu Gly Asp Gly Lys Tyr Ser Gln Leu Arg
35 40 45
Gly Ile Pro Lys Gly Glu Lys Glu Arg Ser Val Ser Phe Gln Glu Leu
50 55 60
Lys Asp Trp Gly Ala Lys Asn Val Ile Lys Met Ser Pro Ala Pro Ala
65 70 75 80
Asn Lys Val Pro His Ser Ala Ala Asn Leu Pro Leu Arg Phe Gly Arg
85 90 95
Thr Ile Asp Glu Lys Arg Ser Pro Ala Ala Arg Val Asn Met Glu Ala
100 105 110
Gly Thr Arg Ser His Phe Pro Ser Leu Pro Gln Arg Phe Gly Arg Thr
115 120 125
Thr Ala Arg Ser Pro Lys Thr Pro Ala Asp Leu Pro Gln Lys Pro Leu
130 135 140
His Ser Leu Gly Ser Ser Glu Leu Leu Tyr Val Met Ile Cys Gln His

145 150 155 160
 Gln Glu Ile Gln Ser Pro Gly Gly Lys Arg Thr Arg Arg Gly Ala Phe
 165 170 175
 Val Glu Thr Asp Asp Ala Glu Arg Lys Pro Glu Lys
 180 185

<210> 34
 <211> 564
 <212> DNA
 <213> Mouse

<400> 34
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 gacggaaaaa actcccagct gagaggaatc ccaaaagggg aaaaggaaag aagtgtcagt 180
 ttccaagaac taaaagattg gggggcaaag aatgttatta agatgagtcc agccctgcc 240
 aacaagatgc ccactcagc agccaacctg cccctgagat ttggaaggac catagatgag 300
 aaaagaagcc ccgcagcac ggtcaacatg gaggcaggga ccaggagcca ttccccagc 360
 ctgccccaaa ggtttgggag aacaacagcc agaagcccca agacaccgcg tgatttgcca 420
 cagaacccc tgactcact gggctccagc gagttgctct acgtcatgat ctgccagcac 480
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 gatgcagaaa ggaaaccaga aaaa 564

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<220>
 <223> primer

<400> 35
 agtcgacagt atggaggcgg agccctc 27

<210> 36
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 36
 gactagtcca aatgttccag gccgggatg 29

<210> 37
 <211> 432
 <212> PRT
 <213> Rat

<400> 37
 Met Glu Ala Glu Pro Ser Gln Pro Pro Asn Gly Ser Trp Pro Leu Gly
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 Gln Asn Gly Ser Asp Val Glu Thr Ser Met Ala Thr Ser Leu Thr Phe
 20 25 30
 Ser Ser Tyr Tyr Gln His Ser Ser Pro Val Ala Ala Met Phe Ile Ala
 35 40 45
 Ala Tyr Val Leu Ile Phe Leu Leu Cys Met Val Gly Asn Thr Leu Val
 50 55 60
 Cys Phe Ile Val Leu Lys Asn Arg His Met Arg Thr Val Thr Asn Met
 65 70 75 80
 Phe Ile Leu Asn Leu Ala Val Ser Asp Leu Leu Val Gly Ile Phe Cys
 85 90 95
 Met Pro Thr Thr Leu Val Asp Asn Leu Ile Thr Gly Trp Pro Phe Asp
 100 105 110
 Asn Ala Thr Cys Lys Met Ser Gly Leu Val Gln Gly Met Ser Val Ser
 115 120 125
 Ala Ser Val Phe Thr Leu Val Ala Ile Ala Val Glu Arg Phe Arg Cys
 130 135 140
 Ile Val His Pro Phe Arg Glu Lys Leu Thr Leu Arg Lys Ala Leu Phe
 145 150 155 160
 Thr Ile Ala Val Ile Trp Ala Leu Ala Leu Leu Ile Met Cys Pro Ser
 165 170 175
 Ala Val Thr Leu Thr Val Thr Arg Glu His His Phe Met Leu Asp
 180 185 190
 Ala Arg Asn Arg Ser Tyr Pro Leu Tyr Ser Cys Trp Glu Ala Trp Pro
 195 200 205

Glu Lys Gly Met Arg Lys Val Tyr Thr Ala Val Leu Phe Ala His Ile
 210 215 220
 Tyr Leu Val Pro Leu Ala Leu Ile Val Val Met Tyr Val Arg Ile Ala
 225 230 235 240
 Arg Lys Leu Cys Gln Ala Pro Gly Pro Ala Arg Asp Thr Glu Glu Ala
 245 250 255
 Val Ala Glu Gly Arg Thr Ser Arg Arg Ala Arg Val Val His
 260 265 270
 Met Leu Val Met Val Ala Leu Phe Phe Thr Leu Ser Trp Leu Pro Leu
 275 280 285
 Trp Val Leu Leu Leu Ile Asp Tyr Gly Glu Leu Ser Glu Leu Gln
 290 295 300
 Leu His Leu Leu Ser Val Tyr Ala Phe Pro Leu Ala His Trp Leu Ala
 305 310 315 320
 Phe Phe His Ser Ser Ala Asn Pro Ile Ile Tyr Gly Tyr Phe Asn Glu
 325 330 335
 Asn Phe Arg Arg Gly Phe Gln Ala Ala Phe Arg Ala Gln Leu Cys Trp
 340 345 350
 Pro Pro Trp Ala Ala His Lys Gln Ala Tyr Ser Glu Arg Pro Asn Arg
 355 360 365
 Leu Leu Arg Arg Arg Val Val Val Asp Val Gln Pro Ser Asp Ser Gly
 370 375 380
 Leu Pro Ser Glu Ser Gly Pro Ser Ser Gly Val Pro Gly Pro Gly Arg
 385 390 395 400
 Leu Pro Leu Arg Asn Gly Arg Val Ala His Gln Asp Gly Pro Gly Glu
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 Gly Pro Gly Cys Asn His Met Pro Leu Thr Ile Pro Ala Trp Asn Ile
 420 425 430

<210> 38
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 <212> DNA
 <213> Rat

<400> 38
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 ccggtggcag ccatgttcat cgcggcctac gtgctcatct tcctcctctg catgttgggc 180
 aacaccctgg tctgcttcat tctgctcaag aaccggcaca tgcgcactgt caccaacatg 240
 tttatcctca acctggcgt cagcgacctg ctgggtggca tcttctgcat gccacaacc 300
 ctgttggaac accittatcac tggttggcct ttgacaacg ccacatgcaa gatgagcggc 360
 ttggtgcagg gcatgtccgt gtctgcatcg gttttcacac tggttggccat cgctgtggaa 420
 aggttccgct gcatcgtgca cctttccgc gagaagctga cctttcggaa ggcgtgttc 480
 accatcgagg tgatctgggc tctggcgtg ctcatcatgt gtccctcggc ggtcactctg 540
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 tactcgtgct gggaggcctg gcccgagaag ggcattgcga aggtctacac cgcggtgctc 660
 ttgcgcaca tctacctggt gccgctggcg ctcatcgtag tgatgtacgt gcgcatcgcg 720
 cgcaagctat gccaggcccc cggctctgcg cgcgacacgg aggaggcggg gcccgagggt 780
 ggccgcactt cgcgccgtag ggcccgcgtg gtgcacatgc tggatcatgt ggcgtcttc 840
 ttcacgttgt cctggctgcc actctgggtg ctgctgctgc tcatcgacta tggggagctg 900
 agcgagctgc aactgcacct gctgtcggtc tacgccttcc ccttggcaca ctggctggcc 960
 ttcttccaca gcagcgccaa ccccatcatc tacggctact tcaacgagaa ctccgcccgc 1020
 ggcttccagg ctgccttccg tgcacagctc tgcctggcctc cctgggcccgc ccacaagcaa 1080
 gcctactcgg agcggcccaa cgcctcctg cgcaggcggg tgggtgtgga cgtgcaacct 1140
 agcgactcgg gctgcccac agagtctggc cccagcagcg gggttccagg gcctggccgg 1200
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 aaccacatgc cctcaccat cccggcctgg aacatttga 1299

<210> 39
 <211> 12
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> the C-terminus of the polypeptide is amide (-CONH2) form

<400> 39
 Met Pro His Ser Phe Ala Asn Leu Pro Leu Arg Phe
 1 5 10

<210> 40
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> the C-terminus of the polypeptide is amide (-CONH2) form

<400> 40
Val Pro Asn Leu Pro Gln Arg Phe
1 5

<210> 41
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> the C-terminus of the polypeptide is amide (-CONH2) form

<400> 41
Ser Ala Gly Ala Thr Ala Asn Leu Pro Arg Ser
1 5 10

<210> 42
<211> 36
<212> DNA
<213> Human

<400> 42
atgccacact ccttcgcca cttgccattg agattt 36

<210> 43
<211> 36
<212> DNA
<213> Human

<400> 43
agtgcctggag caacagccaa cctgcctctg agatct 36

<210> 44
<211> 24
<212> DNA
<213> Human

<400> 44
gttcctaacc tgcccaaaag gttt 24

<210> 45
<211> 276
<212> DNA
<213> Human

<400> 45
atggaaatta tttcatcaaa actattcatt ttattgactt tagccacttc aagcttggtta 60
acatcaaaaca ttttttgtgc agatgaatta gtgatgtcca atcttcacag caaagaaaaat 120
tatgacaaat attctgagcc tagaggatac ccaaaagggg aaagaagcct caattttgag 180
gaattaaaag attggggacc aaaaaatggtt attaagatga gtacacctgc agtcaataaa 240
atgccacact ccttcgcca cttgccattg agatttggga ggaacgttca agaagaaaga 276

<210> 46
<211> 336
<212> DNA
<213> Human

<400> 46
atggaaatta tttcatcaaa actattcatt ttattgactt tagccacttc aagcttggtta 60
acatcaaaaca ttttttgtgc agatgaatta gtgatgtcca atcttcacag caaagaaaaat 120
tatgacaaat attctgagcc tagaggatac ccaaaagggg aaagaagcct caattttgag 180
gaattaaaag attggggacc aaaaaatggtt attaagatga gtacacctgc agtcaataaa 240
atgccacact ccttcgcca cttgccattg agatttggga ggaacgttca agaagaaaga 300
agtgcctggag caacagccaa cctgcctctg agatct 336

<210> 47
<211> 393
<212> DNA
<213> Human

<400> 47
atggaaatta tttcatcaaa actattcatt ttattgactt tagccacttc aagcttggtta 60
acatcaaaaca ttttttgtgc agatgaatta gtgatgtcca atcttcacag caaagaaaaat 120
tatgacaaat attctgagcc tagaggatac ccaaaagggg aaagaagcct caattttgag 180
gaattaaaag attggggacc aaaaaatggtt attaagatga gtacacctgc agtcaataaa 240
atgccacact ccttcgcca cttgccattg agatttggga ggaacgttca agaagaaaga 300

agtgctggag caacagccaa cctgcctctg agatctgga agaaatatgga ggtgagcctc 360
gtgagacgtg ttcctaacct gccccaaagg ttt 393

<210> 48
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 48
ccctggggct tcttctgtct tctatgt 27

<210> 49
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 49
agcgattcat tttattgact ttagca 26

<210> 50
<211> 203
<212> PRT
<213> Rat

<400> 50
Met Glu Ile Ile Ser Ser Lys Arg Phe Ile Leu Leu Thr Leu Ala Thr
1 5 10 15
Ser Ser Phe Leu Thr Ser Asn Thr Leu Cys Ser Asp Glu Leu Met Met
20 25 30
Pro His Phe His Ser Lys Glu Gly Tyr Gly Lys Tyr Tyr Gln Leu Arg
35 40 45
Gly Ile Pro Lys Gly Val Lys Glu Arg Ser Val Thr Phe Gln Glu Leu
50 55 60
Lys Asp Trp Gly Ala Lys Lys Asp Ile Lys Met Ser Pro Ala Pro Ala
65 70 75 80
Asn Lys Val Pro His Ser Ala Ala Asn Leu Pro Leu Arg Phe Gly Arg
85 90 95
Asn Ile Glu Asp Arg Arg Ser Pro Arg Ala Arg Ala Asn Met Glu Ala
100 105 110
Gly Thr Met Ser His Phe Pro Ser Leu Pro Gln Arg Phe Gly Arg Thr
115 120 125
Thr Ala Arg Arg Ile Thr Lys Thr Leu Ala Gly Leu Pro Gln Lys Ser
130 135 140
Leu His Ser Leu Ala Ser Ser Glu Leu Leu Tyr Ala Met Thr Arg Gln
145 150 155 160
His Gln Glu Ile Gln Ser Pro Gly Gln Glu Gln Pro Arg Lys Arg Val
165 170 175
Phe Thr Glu Thr Asp Asp Ala Glu Arg Lys Gln Glu Lys Ile Gly Asn
180 185 190
Leu Gln Pro Val Leu Gln Gly Ala Met Lys Leu
195 200

<210> 51
<211> 609
<212> DNA
<213> Rat

<400> 51
atggaaatta ttcatcaaa gcgattcatt ttattgactt tagcaacttc aagcttctta 60
acttcaaaca cctttgttc agatgaatta atgatgcccc attttcacag caaagaaggt 120
tatggaaaat attaccagct gagaggaatc ccaaaagggg taaaggaaag aagtgtcact 180
tttcaagaac tcaaagattg gggggcaaaag aaagatatga agatgagtc agcccttgcc 240
aacaaggtgc ccactcagc agccaacctt ccctgaggt tteggaggaa catagaagac 300
agaagaagcc ccagggcagc ggccaacatg gaggcaggga ccatgagcca ttttccagc 360
ctgccccaaa ggtttgggag aacaacagcc agacgcatca ccaagacact ggctggttg 420
ccccagaaat cctgcactc cctggcctcc agtgaattgc tctatgccat gacccgccag 480
catcaagaaa ttcagagtc tggtaagag caacctagga aacgggtgtt cacggaaaca 540
gatgatgcag aaaggaaaca agaaaaata ggaaacctcc agccagtcct tcaaggggct 600
atgaagctg 609

<210> 52

<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 52
ttctagattt tggacaaaat ggaaatt

27

<210> 53
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<400> 53
cgtctttagg gacaggctcc agatttc

27

<210> 54
<211> 430
<212> PRT
<213> Human

<400> 54
Met Glu Gly Glu Pro Ser Gln Pro Pro Asn Ser Ser Trp Pro Leu Ser
1 5 10 15
Gln Asn Gly Thr Asn Thr Glu Ala Thr Pro Ala Thr Asn Leu Thr Phe
20 25 30
Ser Ser Tyr Tyr Gln His Thr Ser Pro Val Ala Ala Met Phe Ile Val
35 40 45
Ala Tyr Ala Leu Ile Phe Leu Cys Met Val Gly Asn Thr Leu Val
50 55 60
Cys Phe Ile Val Leu Lys Asn Arg His Met His Thr Val Thr Asn Met
65 70 75 80
Phe Ile Leu Asn Leu Ala Val Ser Asp Leu Leu Val Gly Ile Phe Cys
85 90 95
Met Pro Thr Thr Leu Val Asp Asn Leu Ile Thr Gly Trp Pro Phe Asp
100 105 110
Asn Ala Thr Cys Lys Met Ser Gly Leu Val Gln Gly Met Ser Val Ser
115 120 125
Ala Ser Val Phe Thr Leu Val Ala Ile Ala Val Glu Arg Phe Arg Cys
130 135 140
Ile Val His Pro Phe Arg Glu Lys Leu Thr Leu Arg Lys Ala Leu Val
145 150 155 160
Thr Ile Ala Val Ile Trp Ala Leu Ala Leu Ile Met Cys Pro Ser
165 170 175
Ala Val Thr Leu Thr Val Thr Arg Glu Glu His His Phe Met Val Asp
180 185 190
Ala Arg Asn Arg Ser Tyr Pro Leu Tyr Ser Cys Trp Glu Ala Trp Pro
195 200 205
Glu Lys Gly Met Arg Arg Val Tyr Thr Thr Val Leu Phe Ser His Ile
210 215 220
Tyr Leu Ala Pro Leu Ala Leu Ile Val Val Met Tyr Ala Arg Ile Ala
225 230 235 240
Arg Lys Leu Cys Gln Ala Pro Gly Pro Ala Pro Gly Gly Glu Glu Ala
245 250 255
Ala Asp Pro Arg Ala Ser Arg Arg Arg Ala Arg Val Val His Met Leu
260 265 270
Val Met Val Ala Leu Phe Phe Thr Leu Ser Trp Leu Pro Leu Trp Ala
275 280 285
Leu Leu Leu Ile Asp Tyr Gly Gln Leu Ser Ala Pro Gln Leu His
290 295 300
Leu Val Thr Val Tyr Ala Phe Pro Phe Ala His Trp Leu Ala Phe Phe
305 310 315 320
Asn Ser Ser Ala Asn Pro Ile Ile Tyr Gly Tyr Phe Asn Glu Asn Phe
325 330 335
Arg Arg Gly Phe Gln Ala Ala Phe Arg Ala Arg Leu Cys Pro Arg Pro
340 345 350
Ser Gly Ser His Lys Glu Ala Tyr Ser Glu Arg Pro Gly Gly Leu Leu
355 360 365
His Arg Arg Val Phe Val Val Val Arg Pro Ser Asp Ser Gly Leu Pro
370 375 380
Ser Glu Ser Gly Pro Ser Ser Gly Ala Pro Arg Pro Gly Arg Leu Pro
385 390 395 400

Leu Arg Asn Gly Arg Val Ala His His Gly Leu Pro Arg Glu Gly Pro
 405 410 415
 Gly Cys Ser His Leu Pro Leu Thr Ile Pro Ala Trp Asp Ile
 420 425 430

<210> 55
 <211> 1290
 <212> DNA
 <213> Human

<400> 55
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 aacactgagg ccaccccggc tacaaacctc accttctcct cctactatca gcacacctcc 120
 cctgtggcgg ccatgttcat tgtggcctat gcgctcatct tcctgtcttg catgggtggc 180
 aacaccctgg tctgtttcat cgtgtcctcaag aaccgggcaca tgcatactgt caccaacatg 240
 ttcattctca acctggctgt cagtgaacctg ctgggtgggca tcttctgcat gcccaccacc 300
 ctgttggaca acctcatcac tgggtggccc ttcgacaatg ccacatgcaa gatgagcggc 360
 ttggtgcagg gcatgtctgt gtcggcttcc gttttcacac tgggtggccat tgctgtggaa 420
 aggttccgct gcatcgtgca cccittccgc gagaagctga ccttgcggaa ggcgctcgtc 480
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 accgtcaccg gtgaggagca ccacttcatg gtggacggcc gcaaccgctc ctaccctctc 600
 tactcttgct gggaggcctg gcccgagaag ggcatgcgca gggcttacac cactgtgctc 660
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 cgcaagctct gccaggcccc gggcccgggc cccggggggc aggaggctgc ggaccgcgca 780
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 aacagcagcg ccaaccccat catctacggc tacttcaacg agaacttccg ccgcggttcc 1020
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 ctgccctca ccatccagc ctgggatata 1290

<210> 56
 <211> 1290
 <212> DNA
 <213> Human

<400> 56
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 aacactgagg ccaccccggc tacaaacctc accttctcct cctactatca gcacacctcc 120
 cctgtggcgg ccatgttcat tgtggcctat gcgctcatct tcctgtcttg catgggtggc 180
 aacaccctgg tctgtttcat cgtgtcctcaag aaccgggcaca tgcatactgt caccaacatg 240
 ttcattctca acctggctgt cagtgaacctg ctgggtgggca tcttctgcat gcccaccacc 300
 ctgttggaca acctcatcac tgggtggccc ttcgacaatg ccacatgcaa gatgagcggc 360
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 tactcttgct gggaggcctg gcccgagaag ggcatgcgca gggcttacac cactgtgctc 660
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 ccgcaagctg acctggtcac cgtctacgcc ttcccttctg cgcactggct ggccttcttc 960
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 ctgccctca ccatccagc ctgggatata 1290

<210> 57
 <211> 31
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> primer

<400> 57
 gtgcacatgg agggggagcc ctccagcct c

<210> 58
 <211> 29
 <212> DNA

<213> Artificial Sequence

<220>

<223> primer

<400> 58

actagttcag atatcccagg ctggaatgg

29

<210> 59

<211> 58

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 59

tatgagcctg aactttgaag aactgaaaga ttgggtccg aaaaatgtga ttaaaatg

58

<210> 60

<211> 61

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 60

agcaccctgg cggatgaataa aatgccgcat agctttgcga atctgccgct gcgtttttgc
c

60

61

<210> 61

<211> 62

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 61

ggatgctcatt ttaatcacat ttttcggacc ccaatctttc agttcttcaa agttcaggct
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60

62

<210> 62

<211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Primer

<400> 62

tcggggcaaa aacgcagcgg cagattcgca aagctatgcg gcattttatt caccgccgg

59